US-CL-CURRENT: 704/201,704/500 ,704/503

US-PAT-NO: 5974380
DOCUMENT-IDENTIFIER: US 5974380 A
TITLE: Multi-channel audio decoder
DATE-ISSUED: October 26, 1999
INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
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ABSTRACT:
    A subband audio coder employs perfect/non-perfect reconstruction filters,
predictive/non-predictive subband encoding, transient analysis, and
psycho-acoustic/minimum mean-square-error (mmse) bit allocation over time,
frequency and the multiple audio channels to encode/decode a data stream to
generate high fidelity reconstructed audio. The audio coder windows the
multi-channel audio signal such that the frame size, i.e. number of bytes, is
constrained to lie in a desired range, and formats the encoded data so that the
individual subframes can be played back as they are received thereby reducing
latency. Furthermore, the audio coder processes the baseband portion (0-24
kHz) of the audio bandwidth for sampling frequencies of 48 kHz and higher with
the same encoding/decoding algorithm so that audio coder architecture is future
compatible.
22 Claims, 38 Drawing figures
Exemplary Claim Number: 1
Number of Drawing Sheets: 26

CLPV:
a demultiplexer that a) detects the sync word, b) unpacks the frame header to
extract a window size that indicates a number of audio samples in the frame and
a frame size that indicates a number of bytes in the frame, said window size
being set as a function of the ratio of the transmission rate to the encoder
sampling rate so that the frame size is constrained to be less than the size of
the input buffer, c) unpacks the audio header to extract the number of
subframes in the frame and the number of encoded audio channels, and d)
sequentially unpacks each subframe to extract the audio side information
including the number of sub-subframes, demultiplex the baseband audio codes in
each sub-subframe into the multiple audio channels and unpack each audio
channel into its subband audio codes, demultiplex the high sampling rate audio
codes into the multiple audio channels up to the decoder sampling rate and skip
the remaining high sampling rate audio codes up to the encoder sampling rate,
and detects the unpack sync to verify the end of the subframe;

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the input buffer, c) unpacks the audio header to extract the number of
subframes in the frame and the number of encoded audio channels, and d)
sequentially unpacks each subframe to extract the audio side information,
demultiplex the baseband audio codes in each sub-subframe into the multiple
audio channels and unpack each audio channel into its subband audio codes,
demultiplex the high sampling rate audio codes into the multiple audio channels
up to the decoder sampling rate and skip the remaining high sampling rate audio
codes up to the encoder sampling rate, and detects the unpack sync to verify
the end of the subframe;

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being set as a function of the ratio of the transmission rate to the encoder sampling rate so that the frame size is constrained to be less than the size of the input **buffer,** c) unpacks the **audio** header to extract the number of subframes in the frame and the number of encoded **audio** channels, and d) sequentially unpacks each subframe to extract the **audio** side information including the number of sub-subframes, and demultiplex the **audio** codes in each sub-subframe into the **multiple audio channels** and unpack each **audio** channel into its subband **audio** codes;

CLPV:
a demultiplexer that a) unpacks the frame header to extract a window size that indicates a number of **audio** samples in the frame, said window size being set as a function of the ratio of the transmission rate to the encoder sampling rate so that the frame size is constrained to be less than the size of the input **buffer,** b) unpacks the **audio** header to extract the number of subframes in the frame and the number of encoded **audio** channels, and c) sequentially unpacks each subframe to extract the **audio** side information, and demultiplex the **audio** codes into the **multiple audio channels** and unpack each **audio** channel into its subband **audio** codes;